AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

PUBLIC HEALTH ASSESSMENT

R & H OIL COMPANY
EPA FACILITY ID: TXD057577579

AND

TROPICANA ENERGY COMPANY
EPA FACILITY ID: TX0002369072

SAN ANTONIO, BEXAR COUNTY, TEXAS

December 16, 2003

DOCUMENTATION:

COPY OF A PUBLIC HEALTH ASSESSMENT PREPARED BY THE TEXAS DEPARTMENT OF HEALTH UNDER A COOPERATIVE AGREEMENT WITH THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, ATLANTA, GEORGIA.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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DECEMBER 16, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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SAN ANTONIO, BEXAR COUNTY, TEXAS

Prepared by:

Texas Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

FOREWORD

The Agency for Toxic Substances and Disease Registry, ATSDR, was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as the *Superfund* law. This law set up a fund to identify and clean up our country's hazardous waste sites. The Environmental Protection Agency, EPA, and the individual states regulate the investigation and clean up of the sites.

Since 1986, ATSDR has been required by law to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. (The legal definition of a health assessment is included on the inside front cover.) If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements. The public health assessment program allows the scientists flexibility in the format or structure of their response to the public health issues at hazardous waste sites. For example, a public health assessment could be one document or it could be a compilation of several health consultations the structure may vary from site to site. Nevertheless, the public health assessment process is not considered complete until the public health issues at the site are addressed.

Exposure: As the first step in the evaluation, ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, other government agencies, businesses, and the public. When there is not enough environmental information available, the report will indicate what further sampling data is needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ATSDR scientists evaluate whether or not these contacts may result in harmful effects. ATSDR recognizes that children, because of their play activities and their growing bodies, may be more vulnerable to these effects. As a policy, unless data are available to suggest otherwise, ATSDR considers children to be more sensitive and vulnerable to hazardous substances. Thus, the health impact to the children is considered first when evaluating the health threat to a community. The health impacts to other high risk groups within the community (such as the elderly, chronically ill, and people engaging in high risk practices) also receive special attention during the evaluation.

ATSDR uses existing scientific information, which can include the results of medical, toxicologic and epidemiologic studies and the data collected in disease registries, to determine the health effects that may result from exposures. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances is not available. When this is so, the report will suggest what further public health actions are needed.

Conclusions: The report presents conclusions about the public health threat, if any, posed by a site. When health threats have been determined for high risk groups (such as children, elderly, chronically ill, and people engaging in high risk practices), they will be summarized in the conclusion section of the report. Ways to stop or reduce exposure will then be recommended in the public health action plan.

ATSDR is primarily an advisory agency, so usually these reports identify what actions are appropriate to be undertaken by EPA, other responsible parties, or the research or education divisions of ATSDR. However, if there is an urgent health threat, ATSDR can issue a public health advisory warning people of the danger. ATSDR can also authorize health education or pilot studies of health effects, fullscale epidemiology studies, disease registries, surveillance studies or research on specific hazardous substances.

Interactive Process: The health assessment is an interactive process. ATSDR solicits and evaluates information from numerous city, state and federal agencies, the companies responsible for cleaning up the site, and the community. It then shares its conclusions with them. Agencies are asked to respond to an early version of the report to make sure that the data they have provided is accurate and current. When informed of ATSDR's conclusions and recommendations, sometimes the agencies will begin to act on them before the final release of the report.

Community: ATSDR also needs to learn what people in the area know about the site and what concerns they may have about its impact on their health. Consequently, throughout the evaluation process, ATSDR actively gathers information and comments from the people who live or work near a site, including residents of the area, civic leaders, health professionals and community groups. To ensure that the report responds to the community's health concerns, an early version is also distributed to the public for their comments. All the comments received from the public are responded to in the final version of the report.

Comments: If, after reading this report, you have questions or comments, we encourage you to send them to us.

Letters should be addressed as follows:

Attention: Chief, Program Evaluation, Records, and Information Services Branch, Agency for Toxic Substances and Disease Registry, 1600 Clifton Road (E60), Atlanta, GA 30333.

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SUMMARY AND STATEMENT OF ISSUES

The R&H Oil Company/Tropicana Energy Company site was proposed to the National Priorities List (NPL) on June 14, 2001. The 7 acre site is located at 403/419 Somerset Road, San Antonio, Bexar County, Texas, approximately 6.5 miles southwest of downtown San Antonio.

The R&H Oil Company/Tropicana Energy Company site served as a crude oil refinery and fuel blending facility from 1934 until the early 1990's. The facility primarily produced hydrocarbon products, blended and distributed gasoline, and reprocessed used oil. On October 10, 2001, EPA completed the first phase of a clean-up project. The cleanup removed from the site hazardous materials in tanks, above ground storage tanks (AST's), various containers, processing equipment, and piping. EPA also removed some visibly contaminated soils. The cleanup's second phase will address soil and groundwater contamination. The primary contaminants of concern in the shallow groundwater at the site include arsenic, benzene, manganese, and naphthalene.

The Texas Department of Health (TDH) and the Agency for Toxic Substances and Disease Registry (ATSDR) evaluated the environmental information available for the site and identified several exposure pathways through which people might come into contact with site contaminants. These exposure pathways include possible contact with site contaminants in surface water, air, soil, groundwater, and soil gas. On the basis of available information we have concluded that at present the R&H Oil Company/Tropicana Energy Company site poses no apparent public health hazard. If site conditions change, particularly if contaminants migrate into the Edwards Aquifer, a re-evaluation of the public health significance of this site would be necessary.

ATSDR PUBLIC HEALTH CONCLUSION CATEGORIES

CATEGORY A. URGENT PUBLIC HEALTH HAZARD[1]	CATEGORY B. PUBLIC HEALTH HAZARD[1]	CATEGORY C. INDETERMINATE PUBLIC HEALTH HAZARD	CATEGORY D. NO APPARENT PUBLIC HEALTH HAZARD[1]	CATEGORY E. NO PUBLIC HEALTH HAZARD
This category is used for sites where short-term exposures (<1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This category is used for sites that pose a public health hazard due to the existence of long-term exposures(>1 yr) to hazardous substances or conditions that could result in adverse health effects.	This category is used for sites in which "critical" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This category is used for sites where human exposure to contaminated media might be occurring, might have occurred in the past, and/or might occur in the future, but the exposure is not expected to cause any adverse health effects.	This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.
Criteria: Evaluation of available information[2] indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health and requires immediate action or intervention. Such site-specific conditions or exposures might include the presence of serious physical or safety hazards, such as open mine shafts, poorly stored or maintained flammable/explosive substances, or medical devices which, upon rupture, could release radioactive materials.	**Criteria**: Evaluation of available relevant information[2] suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures might include the presence of serious physical hazards, such as open mine shafts, poorly stored or maintained flammable/explosive substances, or medical devices which, upon rupture, could release radioactive materials.	**Criteria**: The health assessor must determine, using professional judgment, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.	**Criteria**: Evaluation of available information[2] indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present or future are not likely to result in any adverse impact on human health.	**Criteria**: Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future.

[1] This determination represents a professional judgment on the basis of critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases, additional data might be required to confirm or further support the decision made.

[2] Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data.

INTRODUCTION

The Agency for Toxic Substances and Disease Registry (ATSDR) was established under the mandate of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. This act, also known as the "Superfund" law, authorized the U.S. Environmental Protection Agency (EPA) to conduct clean-up activities at hazardous waste sites. EPA was directed to compile a list of sites considered hazardous to public health. This list is called the National Priorities List (NPL). The 1986 Superfund Amendments and Reauthorization Act (SARA) directed ATSDR to prepare a Public Health Assessment (PHA) for each NPL site. In 1990, federal facilities were included on the NPL.

In conducting the PHA, three types of information are used: environmental data, community health concerns and health outcome data. The environmental data are reviewed to determine whether people in the community might be exposed to hazardous materials from the NPL facility. If people are being exposed to these chemicals, ATSDR will determine whether the exposure is at levels that might cause harm. Community health concerns are collected to help determine whether health concerns expressed by community members could be related to exposure to chemicals released from the facility. If the community raises concerns about specific diseases in the community, health outcome data (information from state and local databases or health care providers) can be used to address the community concerns. Also, if ATSDR finds that harmful exposures have occurred, health outcome data can be used to determine if illnesses are occurring which could be associated with the hazardous chemicals released from the NPL facility.

In accordance with the Interagency Cooperative Agreement between ATSDR and the Texas Department of Health (TDH), ATSDR and TDH have prepared this PHA for the R&H Oil Company/Tropicana Energy Company site. This PHA presents conclusions about whether exposures are occurring, and whether a health threat is present. In some cases, it is possible to determine whether exposures occurred in the past; however, often a lack of appropriate historical data makes it difficult to quantify past exposures. If it is found that a threat to public health exists, recommendations are made to stop or reduce the threat to public health.

BACKGROUND

Site Description and History

The R&H Oil Company/Tropicana Energy Company National Priorities List site is located at 403/419 Somerset Road, San Antonio, Bexar County, Texas. The site is 6.5 miles southwest of downtown San Antonio and is situated on 7 acres of land. On the northern part of the site is R&H Oil Company. On the southern part of the site is the Tropicana Energy Company [Figure 1]. This site has not been in operation since the early 1990s. The site is bounded on the north, east, and south by commercial properties. Most of the residential properties in the area lie east of the site; the nearest residential property is approximately 120 feet to the east and Kelly Air Force Base (KAFB) is to the west. The site is slightly elevated at the western boundary and gradually slopes down toward the east, in the direction of Somerset Road.

The R&H Oil Company/Tropicana Energy Company operated as a crude oil refinery and fuel blending facility from 1934 until it was abandoned in the early 1990's. The facility primarily produced hydrocarbon products, blended and distributed gasoline, and reprocessed used oils. This oil, which was received from transmission and automotive shops, service stations, military installations, municipal/industrial generators and crude oil facilities, was collected and stored on site in a 10,000 gallon aboveground storage tank (AST). Before being processed and blended, the used oils were centrifuged to remove solids and sludge. Wastes generated from this process remained on the site [1].

In November 1980, San Antonio's electric utility encountered contaminated groundwater on the west side of the property; a strong gasoline odor was noted at a depth of 15 feet [2]. In April 1981, the Texas Department of Water Resources conducted an investigation of the site and found a black oily liquid with a gasoline odor in the shallow aquifer. In January 1985, approximately 200 gallons of waste oil overflowed from a holding tank and onto the parking lot and facility grounds. In August 1988, the Texas Water Commission (TWC) documented hydrocarbon stained soils around the ASTs, API separator, and sump. As a result of that investigation, a Notice of Violation was issued by the TWC for failure to notify the TWC and the EPA of the facility's used oil activities. In April 1990, an 8,000 gallon spill of premium ethanol gasoline occurred that affected 700 square yards. In March 1998, the Texas Natural Resource Conservation Commission (TNRCC), the successor to the TWC, conducted an EPA site inspection to observe and document conditions on the property. The next month, an EPA Superfund contractor began a removal assessment, which was completed in July 1998. Samples were collected from the ASTs, soil, groundwater, and drums. Analysis results of waste streams, soil, and groundwater indicated the presence of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals.

Also in July 1998, the TNRCC conducted a screening site inspection (SSI) to characterize waste sources at the site and to determine whether a release could be attributed to those sources. The TNRCC identified six sources of contamination at the site [1]:

Source 1:	ASTs (tanks 103, 104, 105, 110, 113, 201, 204, 208, 209, 302 and 303)
Source 2:	AST 111
Source 3:	AST 207
Source 4:	55 gallon drums (D-01, D-02, D-03, D-08, D-09, D-26, D-27, Drum 01, Drum 02, and Drum 03)
Source 5:	API separator
Source 6:	Earthen sump

The R&H Oil Company/Tropicana Energy Company site was proposed to the NPL on June 14, 2001. On October 10, 2001, the EPA completed a removal of all contamination sources. During the Phase One portion of the cleanup, the EPA removed and disposed of all hazardous materials located in tanks, the ASTs, containers, processing equipment, and piping. Some visibly contaminated soils were removed as well, and EPA demolished all equipment, tanks, and storage sheds. EPA's Phase Two cleanup operation will begin at a later date and will determine the extent of soil and groundwater contamination [3].

Demographics

According to the 1990 U.S. Census, 4,344 people lived within ½ mile of the facility and approximately 17,349 people lived within 1 mile of the facility. Approximately 95% of the people identified themselves as being of Hispanic origin [Figure 2]. Currently, the site has no workers; however, an unknown number of workers will be involved with the EPA's Phase Two investigation. No schools or day care facilities are within 200 feet of any known source of contamination. Ten schools are located within 1 mile of the site [4].

Land Use and Natural Resource Use

The R&H Oil/Tropicana Energy site is located on seven acres of land, 6.5 miles southwest of downtown San Antonio. The Edwards Aquifer, a karst aquifer with numerous caves, sinkholes, and underground streams, lies below the site. This aquifer is mostly made up of limestone. The Edwards Aquifer, considered one of the most productive carbonate aquifers in the United States, yields over 1,000 gallons of water per minute, and is the sole source of water for the city of San Antonio. In the area of the R&H Oil/Tropicana Energy site the depth to the Edwards Aquifer ranges from 968 to 1,000 feet below ground surface. Recharge to the aquifer occurs when rain, surface water, and runoff percolates downward into the aquifer. The recharge area, which is located north and west of the site, is approximately 4,350 square miles. Groundwater flow in the aquifer is generally to the south and east. The average annual rainfall in San Antonio is approximately 29 inches per year [2].

The shallowest on-site water bearing zone, the shallow alluvial aquifer, is estimated to begin 10 to 15 feet below ground surface. The upper portion of the alluvial aquifer contains 10 feet of impermeable clay. The next 20 feet are coarse sand and gravel with a few clay layers. Below

the alluvial aquifer is an approximately 500-foot-thick, non-water bearing zone composed mostly of clay. Beneath the site, the depth to this zone ranges from 37.5 feet to 52 feet. This zone acts as the lower confining layer for the shallow alluvial aquifer and serves as an aquiclude between the shallow alluvial aquifer and the Edwards Aquifer [2].

The facility is bounded on the north, east and south by commercial properties and by Kelly Air Force Base to the west. The commercial properties include an automotive salvage and repair shop, a restaurant, and bar/lounge establishments. Kelly Air Force Base is currently being restored for civilian use.

Site Visit

TDH personnel visited the site on August 9, 2001. The EPA, TNRCC, and an environmental remediation contractor also were present during the visit. Approximately 3 hours were spent examining the site and the surrounding area. A 6-foot tall chain link fence topped with barbed wire surrounded the perimeter of the site. During the site visit, however, the team observed openings in the fence indicating that access to the site was not restricted. Graffiti was seen on some of the ASTs and facility equipment: evidence of bedrolls, and clothes found at the site also suggested that trespassers had gained access to the site. The weather during the site visit was sunny, hot, and dry, so no water ponding or runoff was present. The TDH observed numerous ASTs, abandoned equipment, 55 gallon drums, an earthen sump, an in-ground petroleum product separator, a smokestack, oil-stained ground near the sump and ASTs, and general waste/debris in storage rooms.

San Antonio Metropolitan Health District (SAMHD) personnel accompanied the TDH during a second site visit on October 18, 2001. All ASTs and equipment had been removed and new fencing had been installed. This team observed no evidence of trespassing. The May 2002 EPA site update states that EPA plans to investigate and address the extent of soil and groundwater contamination when the site is finalized to the NPL.

ENVIRONMENTAL CONTAMINATION/PATHWAYS ANALYSIS/PUBLIC HEALTH IMPLICATIONS

Introduction

Human exposure to, or contact with chemical contaminants, drives the ATSDR's public health assessment process. The release or disposal of chemical contaminants into the environment does not always result in exposure or contact. Chemicals have the potential to cause adverse health effects only if people come into contact with them. People can be exposed to chemicals by breathing (inhalation), eating or drinking a substance containing the contaminant (ingestion), or by skin (dermal) contact with a substance containing the contaminant.

Exposure does not always result in adverse health effects. The type and severity of health effects that may occur from contact with contaminants depend on the toxicologic properties of the contaminants, the amount of the contaminant to which the individual is exposed, how often and/or how long exposure is allowed to occur, the manner in which the contaminant enters or contacts the body, and the number of contaminants to which an individual is exposed (combinations of contaminants). Once exposure occurs, an individual's characteristics including age, sex, nutritional status, genetics, life style, and health status affect how the individual absorbs, distributes, metabolizes, and excretes the contaminant. These factors and characteristics influence whether exposure to a contaminant could or would result in adverse health effects.

As a preliminary step in assessing the potential health risks associated with contaminants at this site, the TDH compared contaminant concentrations to health assessment comparison (HAC) values. HAC values are media-specific contaminant concentrations used to screen contaminants for further evaluation. Noncancer HAC values, also called environmental media evaluation guides (EMEGs) or reference dose media evaluation guides (RMEGs) are based respectively on ATSDR's minimal risk levels (MRLs) or EPA's reference doses (RfDs). MRLs and RfDs are estimates of a daily human exposure to a contaminant that is unlikely to cause adverse noncancer health effects. Cancer risk evaluation guides (CREGs) are based on the EPA's chemical specific cancer slope factors and an estimated excess lifetime cancer risk of one in one million persons exposed for a lifetime. The TDH used standard assumptions to calculate appropriate HAC values [5].

In some instances the TDH compared contaminant concentrations in water with the EPA's maximum contaminant levels (MCLs). MCLs are chemical-specific maximum concentrations allowed in water delivered to the users of a public water system; they are considered protective of public health over a lifetime (70 years) of exposure at an ingestion rate of 2 liters per day. MCLs may be based on available technology and economic feasibility. Although MCLs apply only to public water supply systems, they are often used to help assess the public health implications of contaminants found in water from other sources. While exceeding a HAC value does not necessarily mean that a contaminant represents a public health threat, it does suggest that the contaminant warrants further consideration. Reviewing and integrating relevant toxicological information with plausible exposure situations can help researchers assess the public health significance of contaminants that exceed HAC values. Estimated exposures can be

compared to reported "no observable" and "lowest observable" adverse effects levels (NOAELs and LOAELs) and to known effect levels in humans, when available.

Environmental Contamination

In this evaluation, the TDH considered soil and groundwater samples collected in July 1998 as part of a removal assessment by the EPA. These samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and metals. The TDH also reviewed public well water samples collected in August 1999, February 2000, May 2001, and November 2001 by the Bexar Metropolitan Water District (BMWD. The TDH and the Lower Colorado River Authority (LCRA) laboratories analyzed the BMWD samples for VOCs, SVOCs, PCBs, pesticides, and herbicides. Soil gas samples were collected in March 2000 and analyzed for VOCs. HAC values were used to screen contaminants for further consideration [Appendix C, Tables 2 through 5]. Contaminants found at concentrations below their respective HAC values are not included in the tables.

In reviewing these data, the information provided in the referenced documents was relied upon and it was assumed that adequate Quality Assurance/Quality Control (QA/QC) measures were followed with regard to chain-of-custody, laboratory procedures, and data reporting.

Exposure Pathways

In this section, the possible pathways for exposure to contaminants at the R&H Oil/Tropicana Energy site were evaluated. These possible exposure pathways were examined to determine whether people living or working near the site can be exposed to (or come into contact with) contaminants from the site. Exposure pathways consist of five elements: 1) a source of contamination; 2) transport through an environmental medium; 3) a point of exposure; 4) a plausible manner (route) for the contaminant to get into the body; and 5) an identifiable receptor population. Exposure pathways can be completed, potential, or eliminated.

For a person to be exposed to a contaminant, the exposure pathway must be completed. An exposure pathway is considered completed when all five elements in the pathway are present and exposure has occurred, is occurring, or will plausibly occur in the future. A potential pathway is one that is missing at least one of the five elements, but might be considered to be completed in the future as more data become available or site conditions change. Eliminated pathways are those that are missing one or more of the five elements and will never be completed. The exposure pathways considered in this site evaluation are summarized in Table 1.

Evaluation of Exposure Pathways

Table 1.
Evaluation of Exposure Pathways
R & H Oil Company/Tropicana Energy Company - San Antonio, Texas

Pathway Name	Contaminants of Concern	Source	Transport Media	Point of Exposure	Route of Exposure	Exposed Population	Time	Comments
Surface Water (eliminated)	No data	Site operations	Surface water	Off-site On-site	Dermal contact	On-site workers, Trespassers, and Remediation personnel	Past Present Future	Although data were not available for review, surface water is infrequently found on the site. Because of the lack of potential for exposure, this is not considered to be a significant exposure pathway.
Air (incomplete)	No data	Site operations	Air	On-site	Inhalation	On-site workers, Off-site workers, and Nearby residents	Past Present	**Past - indeterminate public health hazard.** Due to the lack of historical ambient air data, past exposure to site contaminants in the air is an indeterminate public health hazard. **Present – no public health hazard.** Since source areas have been removed, this pathway currently poses no public health hazard.
Soil (potential)	Arsenic Benzo(a)pyrene	Site operations	Soil	On-site	Incidental ingestion, Dermal contact	On-site workers, Trespassers, and Remediation personnel	Past Present Future	**No apparent public health hazard.** Obvious areas of contamination as well as identified source areas have been removed. Additionally, access to the site is restricted. Based on a general lack of exposure this pathway currently poses no apparent public health hazard.
Groundwater (potential)	Arsenic, Benzene, Manganese, Naphthalene	Site operations, Spills	Groundwater	On-site monitoring wells	None identified	None identified	Past Present Future	**No public health hazard.** Based on available information people are not currently being exposed to contaminants in the groundwater. If in the future contaminants migrate into the Edwards Aquifer, this conclusion category should be reevaluated.
Soil Gas (potential)	Volatile Organic Compounds (VOCs)	East Kelly Air Force Base	Soil Gas	Off-site	Inhalation	Nearby residents	Past Present Future	**No apparent public health hazard.** Based on the levels of VOCs in the soil gas, no adverse health effects are expected to occur from exposure.

Evaluation of Possible Surface Water Exposure Pathway

The surface water pathway was eliminated as a pathway of concern because (1) the probability of regularly finding surface water on the site is low, (2) the probability of ingesting surface water is low, (3) the potential frequency and duration of any contact with surface water is likely to be low, and (4) the surface area of the skin that would regularly contact surface water on the site would be small.

Evaluation of Possible Air Exposure Pathway

Air sampling data and historical air releases from the R&H Oil Company/Tropicana Energy facility were not available for review. Volatilization of chemicals at the site from the ASTs, chemical overflows and spills likely occurred during the time the facility was operating. The potentially exposed population would have consisted of on-site workers and the surrounding businesses and neighborhood. Because of the lack of historical air sampling data, the potential public health significance of past exposure through the air could not be assessed. Thus, we have concluded that past exposure to contaminants in the air posed an indeterminate public health hazard. Since the site is no longer operating and the source areas have been removed, the air pathway currently poses no public health hazard.

Evaluation of Possible Soil Exposure Pathway

In July 1998, twenty-one soil samples were collected from the R&H Oil portion of the site and two samples were collected from the Tropicana Energy portion of the site. Three background soil samples were collected off site. Samples were collected at a depth of 3 to 6 inches below ground surface. Surface soil samples were not collected.

Although the CREG value for arsenic was exceeded in all 26 samples (site and background samples), all concentrations were well within those normally found in the western United States [6]. Benzo(a)pyrene was not detected in any of the background samples or the samples collected from the R&H Oil portion of the site but was found at concentrations above its CREG value in the two samples collected from the Tropicana Energy portion of the site [Appendix C, Table 2].

Because surface soil samples were not available for review, the potential public health significance of possible past exposures could not be assessed adequately. Currently, the potential for exposure to contaminated soil is low. On the basis of the low potential for exposure, we have concluded the soil pathway poses no apparent public health hazard.

Evaluation of Possible Groundwater Exposure

Kelly Air Force Base (KAFB), a former jet engine repair facility for the military is now in the process of becoming a civilian facility. A groundwater plume has been identified beneath KAFB. East KAFB is approximately 800 feet west of the R&H Oil/Tropicana Energy facility site. According to EPA, the groundwater plume identified at East KAFB is considered to be a separate plume from the one identified beneath the site at R&H Oil/Tropicana Energy facility. The contaminants associated with the East KAFB plume are chlorinated solvents while the contaminants associated with the R&H/Tropicana site are nonchlorinated petroleum

hydrocarbons. Because of the local direction of groundwater flow within the shallow alluvial aquifer, the presence of chlorinated solvents in wells located at the R&H Oil/Tropicana site might be expected.

In July 1998, groundwater samples were collected from a total of 15 wells. Ten monitoring wells were installed in the shallow alluvial aquifer beneath the site and surrounding area. Five of the wells were associated with the Bexar Metropolitan Water District (BMWD) and were screened in the deeper Edwards Aquifer. The BMWD, Public Water System ID #0150249, is the municipal water supplier for the area surrounding the site. Overall a total of 18 samples, 15 samples plus three duplicates, were analyzed for VOCs, SVOCs, PCBs, pesticides, and metals.

Six of the 10 monitoring wells installed in the shallow alluvial aquifer are off site and were installed as part of the Kelly Air Force Base groundwater investigation [2]. Three of these wells are upgradient and three are downgradient from the R&H/Tropicana Energy site. The upgradient wells were screened at depths of 23 to 51.5 feet below ground surface and were used for background water sampling data. The downgradient wells were screened at depths of 19 to 46 feet below ground surface.

The primary contaminants found in the upgradient wells were tetrachloroethene and trichloroethene, contaminants associated with KAFB. These contaminants exceeded the EPA's drinking water standards but not its respective noncancer screening values [Appendix C, Table 3]. The primary contaminants found in the downgradient wells were arsenic, manganese, tetrachloroethene, and trichloroethene. Arsenic exceeded both its carcinogenic risk screening value and its noncancer screening value for children, but did not exceed the drinking water standard. Manganese exceeded its noncancer screening value for children. EPA drinking water standards for tetrachloroethene and trichloroethene were exceeded [Appendix C, Table 4].

Four monitoring wells are located on the Tropicana Energy Company portion of the site with screen interval depths of 9 to 44 feet below ground surface. The primary contaminants of concern found in the on-site shallow groundwater include arsenic, benzene, manganese, and naphthalene. Only arsenic and benzene were found at concentrations above their respective carcinogenic risk screening values. Arsenic, benzene, manganese, and naphthalene were found at concentrations above their respective noncancer screening values [Appendix C, Table 5].

The five BMWD wells were sampled in July 1998. Three of these wells are located upgradient from the site and two are downgradient. The depths of the BMWD wells range from 1,331 to 1,651 feet below ground surface. Analysis of these samples indicated that contaminants were less than their screening values and in many case less than their detection limit.

The TDH also reviewed other well water data. BMWD collected these date in August 1999, February 2000, and May and November 2001 from BMWD wells located at Southside Stations #5, #3, and #4. The samples were analyzed for VOCs, SVOCs, PCBs, pesticides, and herbicides. Southside Station #5, which is downgradient of the site, has four production wells and is the nearest public water supply. These wells are approximately ¼ to ½ mile southeast of the R&H Oil/Tropicana Energy site. Well depths at Station #5 range from 1,423 to 1,651 feet in depth. Southside Station #3 has three production wells and is approximately ½ to 1 mile south of the

R&H Oil/Tropicana Energy site. Well depths range from 1,331 to 1,586 feet. Because the groundwater flows toward the southeast, Southside Station #3 wells are not in the site's flow path. Southside Station #4 has one production well approximately 1 to 2 miles north and upgradient of the site. A review of the data from these wells found that disinfection by-products were present, but only at levels that do not exceed federal drinking water standards.

There is no evidence that the shallow groundwater beneath the site is being used for drinking or other potable purposes. Thus, the presence of contaminants in the shallow groundwater on or near the R&H Oil/Tropicana Energy Company site currently poses no public health hazard. Public drinking water in the area is obtained primarily from the Medina River, located approximately 10 miles southwest of the site. The Edwards Aquifer, which lies deeper below the site, is occasionally used to supplement the surface water source. On the basis of available information, migration of contaminants into the Edwards Aquifer appears unlikely because of the presence of the aquiclude between the shallow alluvial aquifer and the Edwards Aquifer. If contaminants from the shallow alluvial aquifer were to migrate into the Edwards Aquifer the assessment of this exposure pathway would have to be reevaluated.

Evaluation of Possible Soil Gas Exposure Pathway

In March 2000, soil gas samples from eight monitoring wells near the R&H Oil/Tropicana Energy site were collected and analyzed for VOCs. Area residents were concerned that VOCs from the contaminated shallow groundwater, attributed to the East Kelly Air Force Base site, could migrate into the indoor air of homes. The ATSDR evaluated this pathway in a petitioned public health assessment and concluded that the soil gas pathway from contaminated groundwater to the indoor air of nearby residents poses no apparent public health hazard [7].

COMMUNITY HEALTH CONCERNS/HEALTH OUTCOME DATA

Community Health Concerns Evaluation

As part of the public health assessment process, ATSDR and TDH try to learn what concerns people in the area might have about the impact of the site on their health. Consequently, attempts were made to actively gather information and comments from people who live or work near the site. To collect community health concerns related to the R&H Oil/Tropicana Energy site, we contacted several different agencies and individuals were contacted by telephone. These agencies included the regional offices of the Texas Department of Health (TDH Region 8), the Texas Natural Resource Conservation Commission, and the Environmental Protection Agency (EPA Region 6). In addition to state and federal agencies, the San Antonio Metropolitan Health District staff and local citizens were contacted.

The R&H Oil/Tropicana Energy site is located near Kelly Air Force Base. Health concerns are continuing with the nearby former U.S. Air Force military installation. Remediation of groundwater contaminated with chlorinated solvents from KAFB is ongoing. The primary concern related to the R&H Oil/Tropicana Energy site was about the groundwater contamination getting into the public drinking water supply.

Health Outcome Data Evaluation

Health outcome data (HOD) record certain health conditions that occur in populations. These data can provide information on the general health of communities living near a hazardous waste site. They also can provide information on patterns of specified health conditions. Examples of health outcome databases include tumor registries, birth defects registries, and vital statistics. Information from local hospitals and other health care providers may also be used to investigate patterns of disease in a specific population. The TDH and the ATSDR look at appropriate and available health outcome data when a completed exposure pathway or community concern exists. Because of a lack of adequate exposure information on possible past exposure pathways for this site, the TDH did not review health outcome data. Extensive reviews of HOD in the area were conducted during investigations of the KAFB site [8].

CHILDREN'S HEALTH CONCERNS

Children's Health Considerations

The ATSDR and the TDH recognize that the unique vulnerabilities of infants and children demand special emphasis in communities faced with water, soil, air, or food contamination. Children are at greater risk than adults from certain kinds of exposures because they play outdoors and often bring food into contaminated areas. Since they are shorter than adults they breathe the dust, soil, and heavy vapors that are close to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions and access to medical care.

The ATSDR and the TDH considered whether children living near the R&H Oil/Tropicana Energy site were likely to be exposed regularly to site related contaminants, and determined that such exposures are unlikely.

CONCLUSIONS

1. Although site-related contaminants have been detected in various environmental media, currently there are no identifiable situations where exposure to site contaminants is occurring at levels that may be associated with adverse health effects. The relatively low level of exposures may suggest that contaminant concentrations are not currently high enough to be a public health hazard or that exposures to contaminated media are infrequent. In the past, exposure to airborne contaminants may have occurred; because of the lack of historical ambient air data however, the public health significance of this pathway could not be determined. On the basis of available information the TDH determined that this site currently poses no apparent public health hazard.

2. If in the future, site contaminants were to migrate into the Edwards Aquifer, the sole source of drinking water for the city of San Antonio, the conclusions relating to this site would have to be reevaluated.

PUBLIC HEALTH ACTION PLAN

Actions Planned

1. On October 10, 2001, the U.S. Environmental Protection Agency (EPA) completed Phase One of a clean-up project. Hazardous materials, equipment, containers, and some visibly contaminated soils were removed from the site. Phase Two of the EPA clean-up operation will address soil and groundwater contamination.

2. TDH will review additional environmental sampling data as they become available.

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CERTIFICATION

This R&H Oil Company/Tropicana Energy Company Public Health Assessment was prepared by the Texas Department of Health under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was initiated.

Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this Public Health Assessment and concurs with its findings.

Chief, State Programs Section, SSAB, DHAC, ATSDR

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1. U.S. Environmental Protection Agency. Hazard Ranking System Documentation Record, R&H Oil Company. Revised January 29, 2001.

2. Texas Natural Resource Conservation Commission. Screening Site Inspection Report (Volume I of II). R&H Oil Company, a.k.a. El Dorado Refining and Marketing, Inc. June 2000.

3. U.S. Environmental Protection Agency. Site Update. R&H Oil Company, Inc., and Tropicana Energy Company. May 2002.

4. U.S. Environmental Protection Agency. Technical review comments from Chris Villarreal, EPA Remedial Project Manager. Initial Release of Public Health Assessment for R&H Oil Company/Tropicana Energy Company. July 26, 2002.

5. Agency for Toxic Substances and Disease Registry. ATSDR Public Health Assessment Guidance Manual. U.S. Department of Health and Human Services. 1993.

6. Agency for Toxic Substances and Disease Registry. ATSDR Public Health Assessment Guidance Manual. Table 5.1. U.S. Department of Health and Human Services. 1993.

7. Agency for Toxic Substances and Disease Registry. Petitioned Public Health Assessment. Kelly Air Force Base (a/k/a East Kelly Air Force Base). U.S. Department of Health and Human Services. June 1, 2001.

8. Agency for Toxic Substances and Disease Registry. Health Outcome Data Evaluation. Kelly Air Force Base. U.S. Department of Health and Human Services. June 1, 2001.

APPENDIXES

APPENDIX A: Acronyms and Abbreviations
APPENDIX B: Figures
APPENDIX C: Tables
APPENDIX D: Public Comments Received and Responses

Appendix A: Acronyms and Abbreviations

ASTs	Aboveground Storage Tanks
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CREG	Carcinogenic Risk Evaluation Guide
EMEG	Environmental Media Evaluation Guide
EPA	Environmental Protection Agency
ESI	Expanded Site Inspection
HAC Value	Health Assessment Comparison Value
HOD	Health Outcome Data
HRS	Hazard Ranking System
LOAEL	Lowest Observable Adverse Effects Level
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MRL	Minimal Risk Level
NOAEL	No Observable Adverse Effects Level
NPL	National Priorities List
PA/SSI	Preliminary Assessment/Screening Site Inspection
PCBs	Polychlorinated biphenyls
PHA	Public Health Assessment
QA/QC	Quality Assurance/Quality Control
RfD	Reference Dose
RI/FS	Remedial Investigation and Feasibility Study
RMEG	Reference Dose Media Evaluation Guide
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOCs	Semi-Volatile Organic Compounds
TDH	Texas Department of Health
TNRCC	Texas Natural Resource Conservation Commission
TPWD	Texas Parks and Wildlife Department
VOCs	Volatile Organic Compounds

Appendix B: Figures

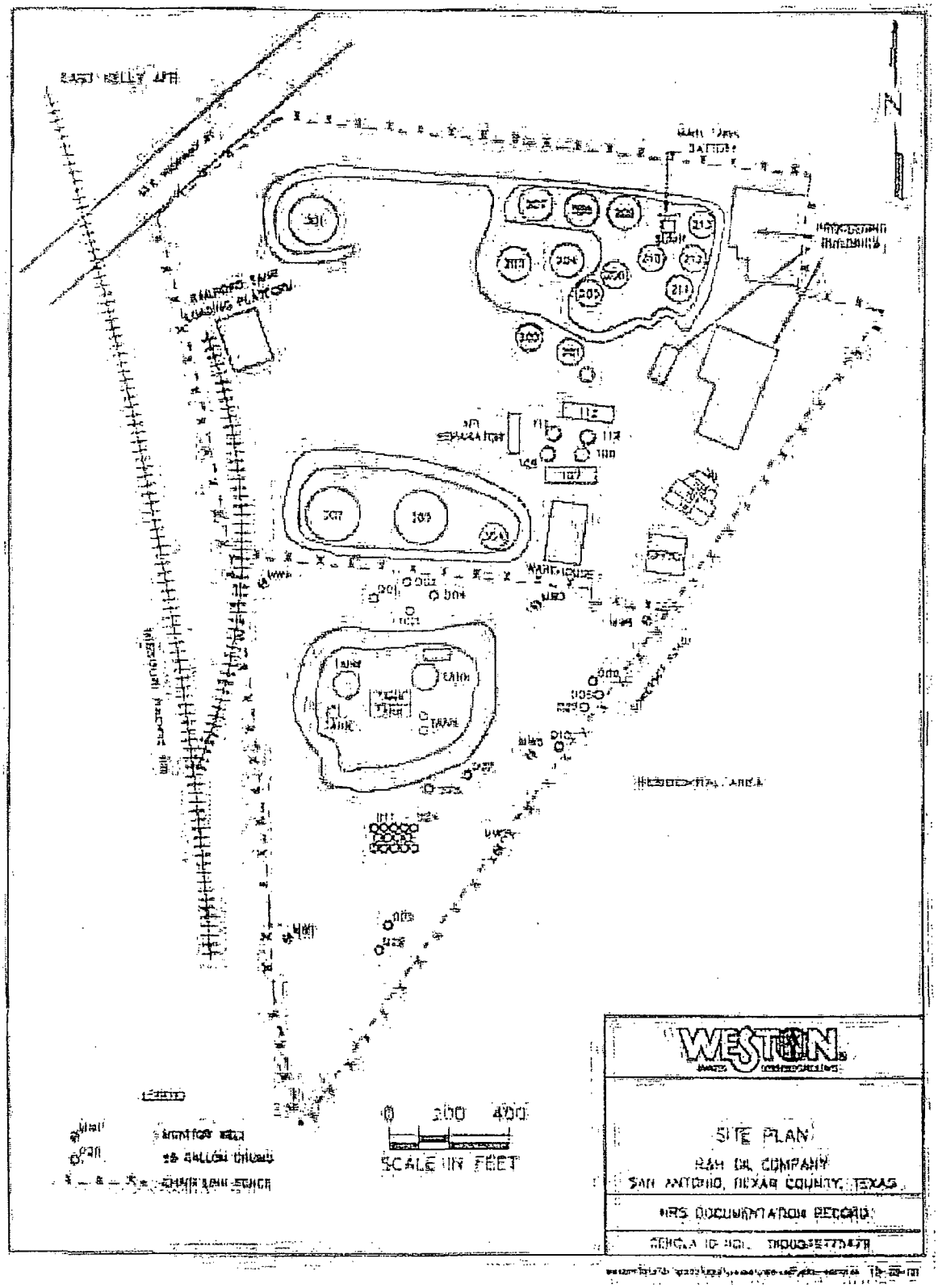
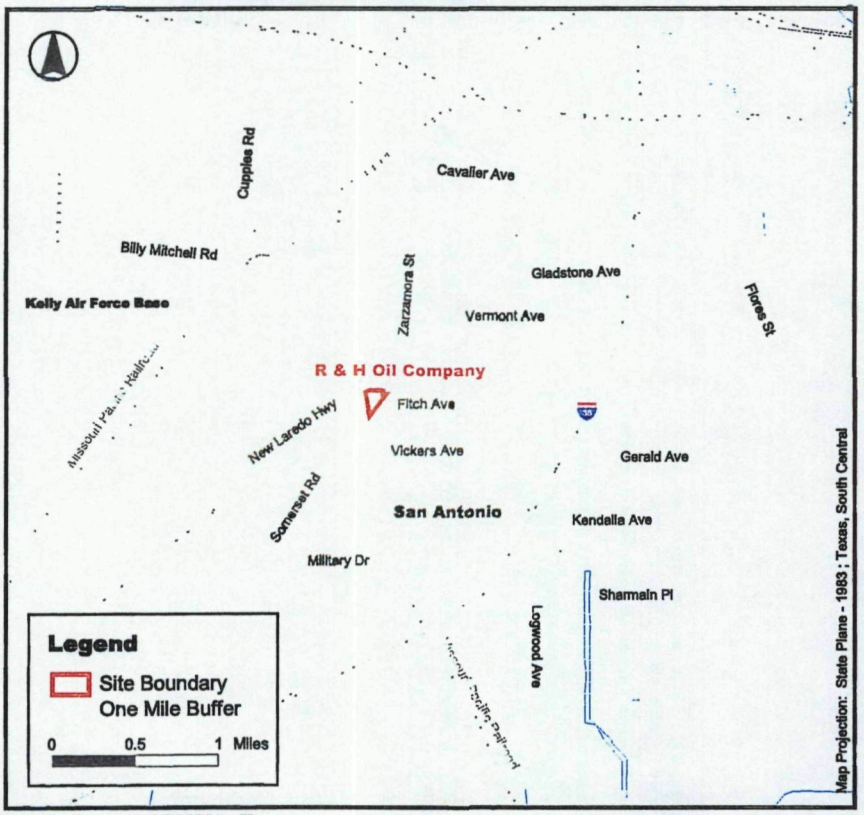


Figure 1: Site Plan

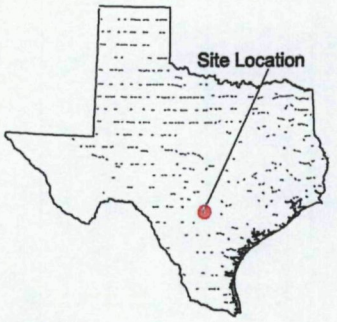
R & H Oil Company

San Antonio, Texas

EPA Facility ID TXD057577579



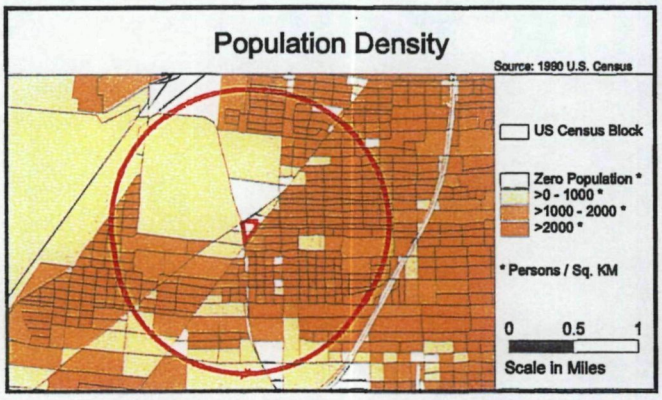
Base Map Source: 1995 TIGER/Line Files

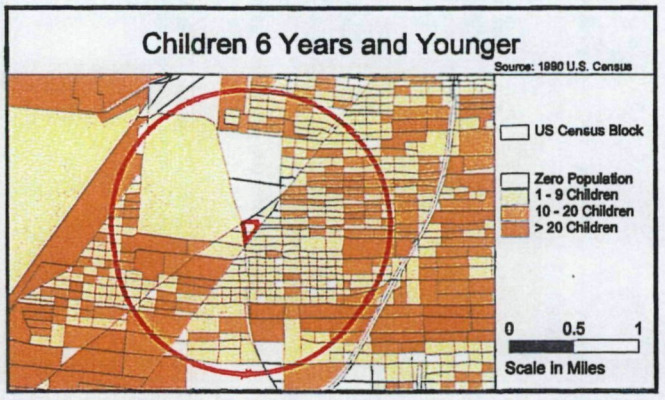


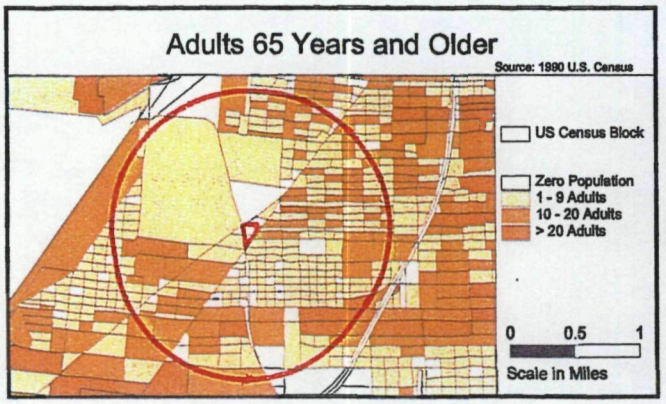
Bexar County, Texas

Demographic Statistics Within Specified Distance*	.5mi	1mi
Total Population	4344	17349
White	2679	11089
Black	6	79
Am. Indian, Eskimo, Aleut	8	37
Asian or Pacific Islander	14	37
Other Race	1634	6114
Hispanic Origin	4174	16335
Children Aged 6 & Younger	551	2267
Adults Aged 65 & Older	411	1837
Females Aged 15 - 44	957	3803
Total Housing Units	1222	5135

Demographics Statistics Source: 1990 US Census
*Calculated using an area-proportion spatial analysis technique







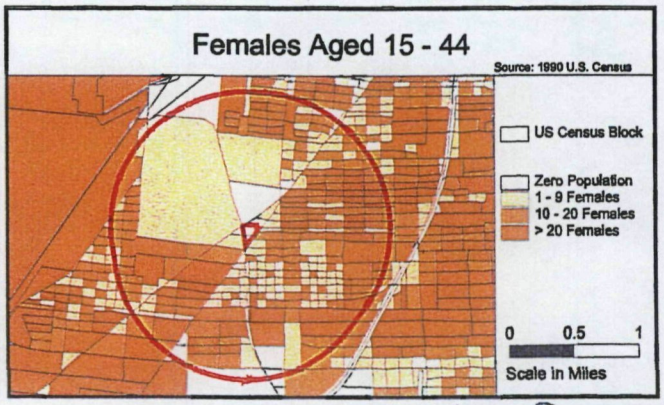


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Figure 2: General Site Location and Demographics Information

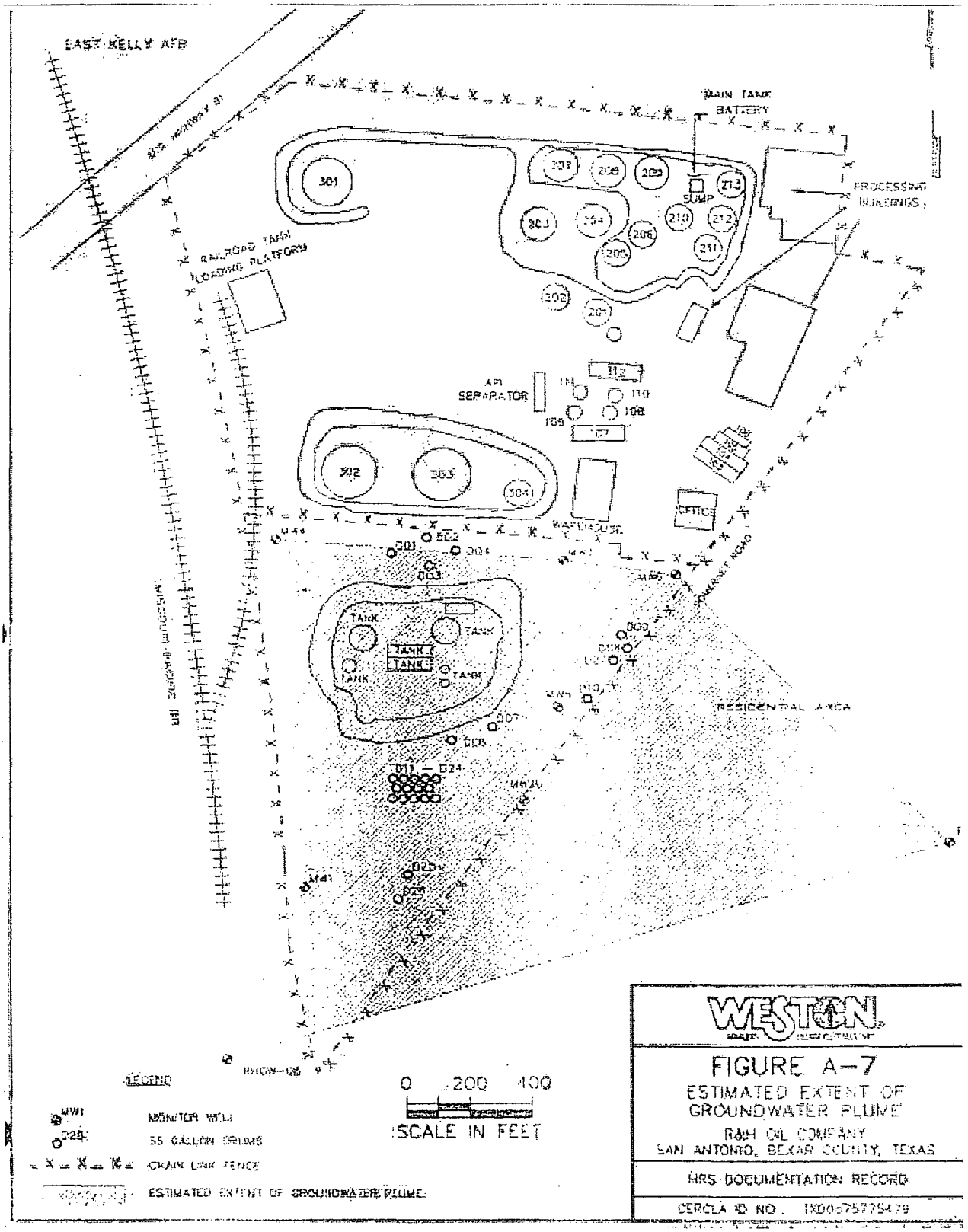

Figure 3: Groundwater Plume

Appendix C: Tables

Table 2 - Soil Sampling
R&H Oil/Tropicana Energy Company NPL Site
July 1998

Constituent	Range (mg/kg)	# >HAC Value per total # samples	HAC Value (mg/kg)
Arsenic			
background	2.74 - 3.49	3/3	0.5 CREG, 20 child / 200 adult - chronic EMEG & RMEG
on site	1.06 - 41.5	23/23	0.5 CREG, 20 child / 200 adult - chronic EMEG & RMEG
Benzo(a)pyrene			
background	n.d.	0/3	0.1 CREG
on site	n.d.- 0.401	2/23	0.1 CREG

n.d. - not detected

Table 3 - Groundwater Sampling: OFF SITE - Upgradient (background)
R&H Oil/Tropicana Energy Company NPL Site
July 1998

Constituent	Range (μg/L)	# >HAC Value per total # samples	HAC Value (μg/L)
Tetrachloroethene	14.8 - 23.2	3/3	0 MCLG, 5 MCL, 10 LTHA, 100 child / 400 adult - RMEG
Trichloroethene	9.3 - 38.9	3/3	0 MCLG, 5 MCL

LTHA - Lifetime Health Advisory
MCL - Maximum Contaminant Level
MCLG - Maximum Contaminant Level Goal

Table 4 - Groundwater Sampling: OFF SITE - Downgradient
R&H Oil/Tropicana Energy Company NPL Site
July 1998

Constituent	Range (μg/L)	# >HAC Value per total # samples	HAC Value (μg/L)
Arsenic	n.d. - 8	1/4	0.02 CREG, 3 child / 10 adult - chronic EMEG & RMEG, 10 MCL
Manganese	51 - 522	1/4	500 child / 2000 adult - RMEG
Tetrachloroethene	9.6 - 12.3	4/4	0 MCLG, 5 MCL, 10 LTHA, 100 child / 400 adult - RMEG
Trichloroethene	5 - 32.8	4/4	0 MCLG, 5 MCL

n.d. - not detected

Table 5 - Groundwater Sampling: ON SITE
R&H Oil/Tropicana Energy Company NPL Site
July 1998

Constituent	Range (μg/L)	# >HAC Value per total # samples	HAC Value (μg/L)
Arsenic	61 - 557	5/5	0.02 CREG, 3 child / 10 adult - chronic EMEG & RMEG, 10 MCL
Benzene	163 - 1970	5/5	0 MCLG, 0.6 CREG, 5 MCL
Manganese	372 - 744	4/5	500 child / 2000 adult - RMEG
Naphthalene	n.d. - 190 J	1/5	100 LTHA, 200 child / 700 adult - Intermediate EMEG & RMEG

J - estimated value

Appendix D: Public Comments Received and Responses

Comments were received from two individuals during the public comment period for the R&H Oil Company/Tropicana Energy Company Public Health Assessment.

Commentator #1:"The R&H Refinery in San Antonio operated for about 60 years. During this period of time, toxic spills from the refinery reached the groundwater. In this regard, ATSDR's Public Health Assessment (PHA) failed to examine groundwater wells outside the R&H site. Further the PHA does not measure how much damage the toxic spills inflicted on residents health who may have drank from contaminated wells within one mile of the toxic R & H site. Why?"

[***RESPONSE***] *Groundwater contamination on and near the site is confined to the shallow aquifer. Figure 3 indicates that the groundwater plume extends 1200 feet (approximately ¼ mile) southeast from the site. This PHA reviewed, groundwater sampling results from four onsite wells and eleven off site wells. The off site wells were approximately 65 feet to 1.7 miles from the site. Site contaminants were not found in the five public wells located nearest the site.*

According to the Screening Site Inspection Report (PHA Reference 2), no water wells from the shallow aquifer are being used for drinking or irrigation. Based on the available information, an exposure pathway to possible groundwater contaminants in the shallow aquifer is not present. If the commentator has additional information regarding persons using the shallow aquifer for potable water, then it should be provided to ATSDR.

Commentator #1: "The PHA conducted by TDH states that the Edwards Aquifer is protected from Refinery's contaminants by a 500 foot layer of clay. The PHA fails to mention the source of this statement. In fact, the PHA contradicts EPA's recommendation that the refinery become a Super fund site because of the potential release of contaminated ground water to the Edwards Aquifer, San Antonio's sole source of drinking water. Further, the R&H Refinery is within 100 yards of Kelly AFB. The assessment fails to mention that contaminated ground water from Kelly's toxic spills have reached the Edwards Aquifer. Records documenting this fact from EPA, TCEQ, EAA, Kelly AFB and Congressman Rodriguez office were not reviewed by TDH. Why?"

[***RESPONSE***] *The information concerning the 500-foot layer of clay is presented on page 4 of the Public Health Assessment and is noted as Reference 2. Page 15 of the PHA indicates that Reference 2 is the Screening Site Inspection Report for this site.*

Under natural conditions, the shallow aquifer beneath Kelly Air Force Base is not connected to the Edwards Aquifer. This is the same as with the R&H refinery site. The shallow aquifer contamination beneath Kelly AFB is due to chemicals from Kelly and possibly other sources. According to the ATSDR health consultation; "Past Exposure to Drinking Water from On-Base Wells 313 and 314", an Edwards Aquifer well on Kelly AFB was documented as receiving contamination from the shallow aquifer. This was due to a leaking pipe located in the shallow aquifer which connected the Kelly AFB well to the deeper Edwards. This well was permanently sealed in 1998. ATSDR concluded that past exposure from ingestion of the well water posed no

apparent health hazard since the concentrations of chemical in the water and the length of estimated exposures were low.

Residents & businesses in the area of the site receive their drinking water from the Bexar Metropolitan Water District (BMWD). Since 1999, the BMWD has relied on surface water obtained from the Medina River as the primary source of drinking water. Groundwater is used only when the demand and usage of the surface water supply is exceeded. Page 10 of the PHA notes that BMWD groundwater sampling results were reviewed and found low levels of disinfection by-products, which did not exceed federal drinking water standards.

Information concerning Kelly Air Force Base and the resulting contaminated groundwater is mentioned on pages 9, 10, and 12. This PHA focus is on determining the public health risk presented by the R&H Oil/Tropicana Energy Company site.

Commentator #1: "It is a known fact that refineries are major sources of toxic volatile organic compounds including cancer-causing benzene". However, ATSDR's public health assessment conducted by TDH found no apparent past or present health hazards after 60 years of R & H Refinery operations. Not one case of cancer is documented in the TDH health assessment, in a neighborhood of 17,000 people. Apparently the TDH did no research of records for elevated levels of liver, kidney or lung cancer within one mile of the toxic R & H site. There is also no mention of birth defects, low birth weights or leukemia in the health assessment. NOTE: Elevated levels of cancers, low birth weights, birth defects, and leukemia were found in zip codes adjacent to Kelly AFB which is within 100 yards of the R & H toxic site. Bottom Line: TDH did not research health records for leukemia, cancers, low birth weight and birth defects within one mile of the toxic site for this health assessment. Why?"

[*RESPONSE*] *TDH and ATSDR look at appropriate and available health outcome data when there is a completed exposure pathway. Due to the lack of completed exposure pathways, a review of health outcome data was not conducted for this site. Health outcome data have been looked at extensively for the Kelly Air Force Base site as indicated on page 11 of this public health assessment.*

Commentator#1: "The ATSDR health assessment on page 10, states there is no evidence that the shallow groundwater "beneath" the R & H refinery site is being used for drinking or other potable purposes. However, the ATSDR health assessment fails to mention past use of groundwater wells within one mile of the toxic R & H site. Why?"

[*RESPONSE*] *Surveys were conducted in 1988, 1996 and 1998 by the U.S. Air Force as part of the Kelly Air Force Base health investigation to identify private well usage. Samples collected from the private wells, which were used only for gardening or lawn care, did indicate some contamination. The contaminants were volatile organic compounds (VOCs) which are not easily taken up by plants and volatilize quickly during watering. It was determined that the VOCs would evaporate during watering and were not at levels of health concern. According to the June 2001 health assessment of East Kelly Air Force Base [Reference 7 in the PHA], area*

residents were notified of the shallow aquifer contamination and were advised not to use the wells for cooking, drinking, or showering. One private well on Quintana Road, which is west of and upgradient from the R&H site, did use the water for drinking. However, the contaminants detected in this well were not at levels of health concern.

We acknowledge that there could have been past usage of groundwater within one mile of the site. Groundwater contamination under and off the site is confined to the shallow aquifer. Figure 3 indicates that the groundwater plume from the R&H/Tropicana site extends about 1200 feet (approximately ¼ mile) southeast from the site. Water samples collected from this location, indicated levels of chlorinated chemicals were above the maximum contaminant level (MCL) standards. Chlorinated chemical contaminants have been linked to spills from Kelly Air Force Base. Nonchlorinated chemical contaminants (arsenic, benzene, manganese, and naphthalene) are associated with the R&H site. If the commentator knows of shallow aquifer wells closer to the site, which are used for drinking purposes, we ask that ATSDR be provided with that information.

Commentator #1: "Refineries are also major causes of common air pollutants. The PHA states that the air passageways "currently" poses no health hazard. It also states that contaminants in the air "might" have occurred in the past. The R & H Refinery operated for over 60 years. There are over 17,000 people (95% Hispanic) living within one mile of the toxic site and 10 schools. My questions are as follows:

•Did TDH research San Antonio Metro Health records for lung cancers, asthma, allergies or other health problems that might have been caused by 60 years of refinery emissions?

•Did 60 years of exposure to air contaminate from the R & H site cause health problems to residents and school children? If not, what scientific findings support this?

•What records were researched by TDH concerning past exposures to air contaminants from the R & H site?

•Why is there no mention of lung cancers after 60 years of air contaminants from the R & H refinery in the ATSDR health assessment?"

[*RESPONSE*] *Historical air sampling records were not available for review. Due to the lack of sampling data, past exposure, if any, to the refinery's emissions cannot be determined. In light of this lack of data, we do acknowledge that exposure to contaminates in the air may, or might, have occurred in the past.*

Approximately 40 percent of the population will get cancer of some type or another. Because of the high background incidence of cancer, except in rare instances, it would be virtually impossible to associate anyone's cancer with a specific environmental cause. Asthma and allergies are common health problems for which there are multiple causes, and adequate population specific rates are not available.

Commentator #1: "The ATSDR assessment states that health outcome data were not reviewed for this site. Why? Is health outcome data a part of the health assessment or not?"

[***RESPONSE***] *Due to the lack of a completed exposure pathway, a review of health outcome data was not conducted for this site. Additionally, health outcome data have been extensively reviewed for the nearby Kelly Air Force Base site.*

Commentator #1: "Page 10 of the assessment states that the soil gas pathway from the contaminated ground water to the indoor air of nearby residents poses no apparent public health hazard. My questions in this matter are as follows:
•Was a complete soil vapor study of the neighborhoods, within one mile of the R & H toxic site conducted? If yes, by who and when? If no, why?

•Did TDH review Dr. Squibb's recommendations on neighborhoods surrounding Kelly AFB to effectively screen the area and study air inside homes for contamination? If no, por qué?"

[***RESPONSE***] *An investigation of the soil gas pathway within one mile of the site was conducted by ATSDR and the results were released on June 1, 2001. The investigation and report are noted as Reference 7 in this PHA. The investigation report mentions the concentration of indoor air contaminates were estimated to be about 60,000 times lower than the concentrations detected in the soil gas. The report states, " . . . no adverse health effects are expected to occur from exposure to the VOCs (volatile organic compounds) detected and estimated to be in the indoor air of homes located over contaminated shallow groundwater."*

Only those reports, recommendations, data, etc., which are cited in this PHA are included in the Reference section of the PHA.

I can't tell from the response...did we look at Dr. Squibb's notes...probably not since is it a Kelly document. Do we need to answer explicitly? We have not seen Dr. Squibb's notes since it is our understanding that they pertain to Kelly AFB. We reviewed information specific to the R&H Oil/Tropicana site.

Commentator #1: "The health assessment fails to mention if monitoring wells are located within one mile of the R&H site and if they include benzene, manganese, arsenic or naphthalene."

[***RESPONSE***] *Groundwater contamination on and near the site is confined to the shallow aquifer. In this PHA, the groundwater sampling results from four shallow wells located on the site and six shallow wells located off the site were reviewed. All ten of these wells are within one mile of the site. Figure 3 indicates that the groundwater plume extends 1200 feet (approximately ¼ mile) southeast from the site.*

Benzene, manganese, arsenic, and naphthalene groundwater sampling results are noted in Tables 4 and 5 on page C-3 of the PHA.

Commentator #1: "The PHA states that officials contacted some residents by phone. However it fails to mention how many were reached, what questions were asked and if any interviews were conducted in Spanish. Ninety five percent of the neighborhood is Hispanic."

[***RESPONSE***] *EPA Superfund staff distributed more than 5,800 informational flyers through schools located within a 2-mile radius of the site. Informational flyers do contain Spanish in the event the citizens are unable to read and understand English. Individuals and local agencies contacted by phone indicated they had a minor concern about R&H Oil Company/Tropicana Energy Company site, but were more concerned with health issues relating to nearby Kelly Air Force Base.*

Commentator #1: "The PHA does not lessen fears that residents and children's health may have been affected by 60 years of air and groundwater contaminants from the R&H Refinery site."

[***RESPONSE***] *The purpose of this PHA is to present conclusions about whether exposures to hazardous chemicals from the R&H Oil Company/Tropicana Energy Company site are occurring and if so, is there a threat to the public health. It is the intent of this PHA to present a public health judgment of the site based on available information.*

The lack of historical air sampling data prevents any determination of past exposure to contaminants from the refinery site. Since chemical sources have been removed from the site, the air pathway currently poses no public health hazard.

Groundwater contamination on and near the site is confined to the shallow aquifer. Under natural conditions, the shallow aquifer beneath the R&H refinery site is not connected to the Edwards Aquifer. A geologic formation prevents contaminants in the shallow groundwater aquifer from entering the deeper Edwards aquifer. Drinking water in the area comes from surface water located approximately 10 miles southwest of the site. If groundwater in the area of the site is used, it is obtained from much greater depths. In this PHA, the groundwater sampling results from shallow wells located both on the site and off the site were reviewed. Based on available information, the public is currently not exposed to contaminants in the shallow groundwater.

Commentator #2: ***(paraphrased)*** The commentator does not agree with the overall conclusion of the PHA and wants the conclusion to be at least *no apparent public health hazard* (category D). This person believes that the more appropriate conclusion should be *indeterminate public health hazard* (category C) because of the insufficient data for air and the non-availability of surface soil samples.

[***RESPONSE***]: *No historical data is available for air pathway exposure. Currently, the air exposure pathway poses no public health hazard because the site is no longer operating and the sources of chemical contamination have been removed.*

Current potential exposure to contaminated soil is low because the obvious areas of soil contamination were removed, the chemical sources have been removed, and access to the site is restricted. Exposure to the soil is not expected to cause any adverse health effects since it is unlikely that people would be exposed to the contaminants often enough at sufficient concentrations to be a health concern.

The Summary, on page one, states the public health assessment conclusion that the site poses no apparent public health hazard. In Conclusion 1, the word "apparent" was inadvertently omitted. The revised Conclusion 1 has been corrected and now reads, "On the basis of available information we have determined that this site currently poses no ***apparent*** *public health hazard."*

Commentator #2: ***(paraphrased)*** The PHA is incomplete as it did not obtain or review health outcome data.]

[***RESPONSE***] *Typically TDH & ATSDR look at appropriate and available health outcome data when a completed exposure pathway or community concern exists. Because none of the exposure pathways for this site were complete, a review of health outcome data was not conducted for this site. Health outcome data have been extensively reviewed for this area during the Kelly Air Force Base investigations.*

Commentator #2: ***(paraphrased)*** The commentator has concerns about the present and future health hazards related to contamination in the shallow aquifer. Arsenic and manganese were not found upgradient. They were found to be above safe levels in the shallow aquifer leaving the site (downgradient). On the site, arsenic and benzene were found in shallow groundwater above their carcinogenic screening values. Benzene and naphthalene were also present onsite above their noncancer screening values.

[***RESPONSE***] *No available evidence suggests that the shallow groundwater beneath the site and in the surrounding area is being used for drinking or other potable purposes. Potable drinking water is supplied to area residents and businesses by the Bexar Metropolitan Water District (BMWD). Since December 1999, almost all of BMWD's water supply is from surface water obtained from the Medina River. The raw surface water intakes on the Medina River are located approximately 10 miles southwest of the site. The BMWD groundwater wells are used only when the demand/usage is greater than the capacity of the surface water supply. Chemical contaminants present in the shallow groundwater on or near the R & H Oil/Tropicana Energy Company site currently pose no public health hazard. The groundwater used for human consumption is obtained from the Edwards aquifer at a much greater depth. Migration of contaminants from the shallow aquifer into the Edwards aquifer appears unlikely. This is due to the presence of an aquiclude, a geologic formation, which does not transmit water between the shallow alluvial aquifer and the deeper Edwards aquifer.*

Commentator #2: ***(paraphrased)*** The commentator does not agree with the PHA's conclusion that soil exposure poses *no apparent public health hazard* (category D). The soil has been historically contaminated with VOCs, SVOCs, and metals. Surface soil samples were not available for review. Review of surface soil sampling and testing of deeper layers of soil might indicate a presence of significant contamination. Recommends more comprehensive soil testing.

*[**RESPONSE**] On-site and background soil samples were collected at three to six inches below ground surface. Phase Two of the EPA clean up project is scheduled to begin in November 2003. The EPA anticipates that soil sampling will be collected at a deeper depth (i.e. below six inches).*

The two soil contaminants of concern at this site are arsenic and benzo(a)pyrene. The Cancer Risk Evaluation Guide (CREG) for arsenic was derived from the EPA's current oral slope factor, which is based on the dose-dependent relationship between ingested arsenic and skin cancer.

Using the EPA's oral slope factor and the highest concentration of arsenic measured in the soil (41.5 mg/kg), we estimate that chronic ingestion of the soil would result in no apparent increased lifetime risk for developing cancer. The highest concentration of benzo(a)pyrene was 0.401 mg/kg. We estimate there to be an insignificant or no increased lifetime risk for developing cancer.

*Category D, **No Apparent Public Health Hazard**, states, "This category is used for sites where human exposure to contaminated media might be occurring, might have occurred in the past, and/or might occur in the future, but the exposure is not expected to cause any adverse health effects." Current potential exposure to contaminated soil is low because the obvious areas of soil contamination were removed, the sources of chemical contaminants have been removed, and access to the site is restricted. Exposure to the soil is not expected to cause any adverse health effects because human exposure to the contaminants often enough and at sufficient concentrations to be a health concern are unlikely. Therefore, TDH and ATSDR believe the proper category for the soil exposure pathway for this site is **no apparent public health hazard**.*